Name _____ Period _____

Chemistry: What to Study Guide

Know how to:

- Find the number of protons, electrons, and neutrons in an element using the periodic table of elements.
- Determine the number of valence electrons in an element.
- Draw Bohr models and Lewis Structures for different elements.
- Determine the number of protons, electrons, and neutrons in an ion or an isotope.
- Draw Lewis Structures showing how electrons are transferred in an ionic bond.
- Know how to read and interpret a phase change diagram
- Know how to identify more and less dense objects

Also be sure to know all the vocabulary words and answers below

Vocabulary words: Define each.

- Boiling – change from liquid to gas
- Electron - a small, negatively charged particle found in the electron cloud
- Electron Cloud – the area around the nucleus of an atom where electrons are found
- Freezing – change from a liquid to a solid
- Gas – a state of matter that has neither a definite shape nor a definite volume
- Heterogeneous – a mixture that does not mix together evenly
- Homogeneous – a mixture that mixes together evenly
- Ionic Bond – type of bond that forms when electrons are transferred from one atom to another
- Liquid – state of matter that has a definite volume but not a definite shape
- Melting – change from solid to liquid

Name _____ Period _____

- Neutron – particle with no charge that is part of the nucleus of the atom
- Noble Gas – unreactive element in Group 18; it already has a full outer shell of electrons
- Nucleus – central part of an atom that is made of protons and neutrons
- Product – what comes out of a chemical reaction (the after!!)
- Proton – particle with a positive charge that is part of the nucleus of the atom
- Reactant – what goes into a chemical reaction (the before!!)
- Solid – state of matter that has a definite shape and a definite volume
- Valence Electron – electron in a atom's outermost shell or energy level

Answer the following questions:

- How is an **ion** different from the basic element?

- How is an **isotope** different from the basic element?

- What happens if we change the number of protons in the element?

- Why do we not include the number of electrons in the atomic mass?

Name _____ Period _____

Use your periodic table to determine:

1. How many protons does a Carbon atom have? _____
2. How many neutrons does a Calcium atom have? _____
3. How many electrons does a Helium atom have? _____
4. How many valence electrons does Argon have? _____
5. How many electrons does oxygen want to gain to form an ion? _____
6. How many electrons in O-18? _____
7. How many neutrons in O-18? _____
8. How many protons in O-18? _____
9. If the charge of the ion is "plus 3" did we gain or lose electrons? _____
10. Draw a Bohr Model for Oxygen. (Hint: show all the electrons in their shells)

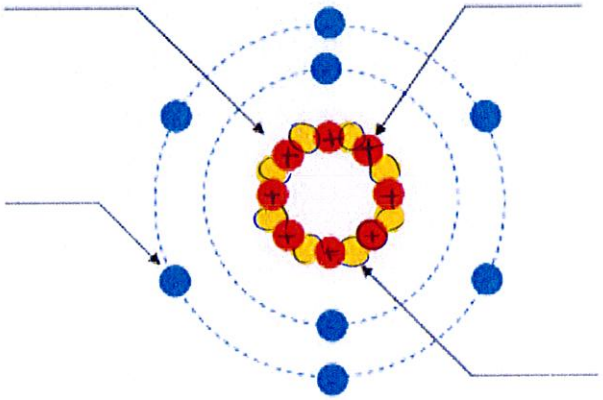
11. Draw a Lewis Structure for Magnesium. (Hint: show valence electrons in pairs)

12. Draw the Lewis structure to show how Magnesium and Chlorine will transfer electrons to form an ionic bond.

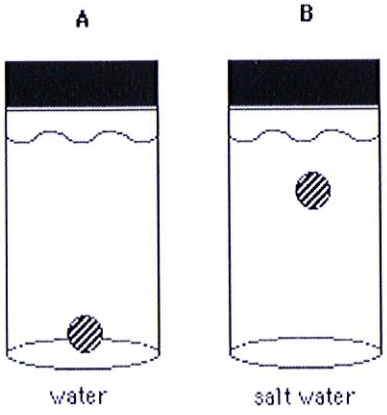
Name _____ Period _____

13. Explain the difference between a heterogeneous and a homogeneous mixture. Name an example of each.

14. Label the protons, electrons, neutrons, and nucleus in the atom below:



15. Which has a higher density, salt water or water? How do you know?



Name _____ Period _____

16. Draw examples of the particles in a solid, liquid, and gas. Explain what the particles are doing in each picture you draw.

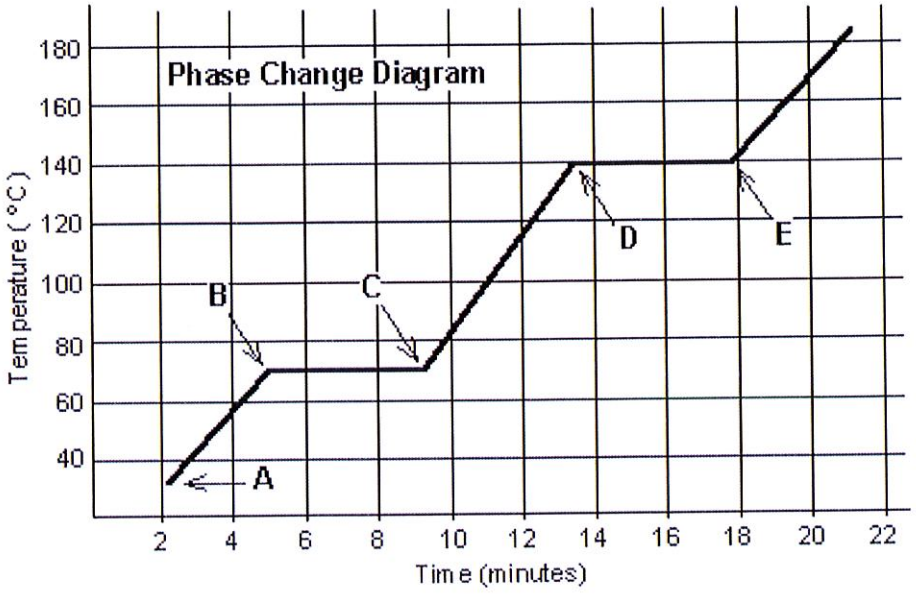
Solid	Liquid	Gas

17. Label the reactants and products in the reaction below:

$$4NH_3 + 5O_2 \rightarrow 4NO + 6H_2O$$

Name _____ Period _____

Use the phase change diagram below to answer the remaining questions:



1. What is the boiling point of this substance? _____

2. What is the state of matter at 60 degrees Celsius? _____

3. Between what two letters do we find only liquids? _____

4. Between what two letters do we find freezing? _____

5. What is the state of matter at 8 minutes? _____

Name _____ Period _____

The answer to each question below is either ionic, covalent, or metallic.

1. In a(n) _____ bond, electrons are shared between two atoms.

2. In a(n) _____ bond, electrons are transferred from one atom to another.

3. In a(n) _____ bond, there is a sea of electrons shared by all the atoms.

4. A(n) _____ compound has a low melting point.

5. A(n) _____ compound is able to conduct electricity.

6. A(n) _____ compound can dissolve in water.

Name _____ Period _____

More Ions ~~Homework~~

Element	Valence Electrons	Gains/Loses How many?	Charge	Cation/Anion
Lithium				
Potassium				
Chlorine				
Cobalt (II)	2	lose 2		
Copper (I)	1	lose 1		
Polonium				
Sulfur				
Phosphorus				
Francium				
Calcium				
Nitrogen				
Bromine				
Silver (III)	3	lose 3		
Selenium				

And some isotopes:

Carbon - 14

Atomic mass: _____

Atomic number: _____

Protons: _____

Electrons: _____

Neutrons: _____

Iodine - 60

Atomic mass: _____

Atomic number: _____

Protons: _____

Electrons: _____

Neutrons: _____